THE INVENTION CLAIMED IS:

1. A modulated laser light detector, comprising:

(a) at least one laser light photosensor, which generates at least one first electrical signal when receiving modulated laser light energy having at least one predetermined range of wavelengths and at least one predetermined range of modulation frequencies;

(b) at least one amplifier stage that receives said at least one first electrical signal and outputs at least one second electrical signal having a first waveform that exhibits voltage components of both positive-going and negative-going regions;

(c) a phase and frequency detector that receives said at least one second electrical signal and generates a lock signal that corresponds to a zero crossing of said first waveform;

(d) at least one synchronous rectifier stage that receives said lock signal and receives said at least one second electrical signal, and generates at least one third electrical signal of a second waveform that comprises a substantially rectified version of said first waveform;

(e) at least one low pass filter that receives said at least one said third electrical signal and outputs at least one fourth electrical signal that comprises a substantially DC voltage; and

(f) at least one signal strength detector that inspects the substantially DC voltage of said at least one fourth electrical signal, and determines a relative strength of said received modulated laser light energy.

2. The modulated laser light detector as recited in claim 1, further comprising: at least one automatic gain control circuit that is in electrical communication with said at least one amplifier stage;

wherein said at least one signal strength detector comprises a processing circuit and an associated memory circuit having a plurality of memory elements which contain computer executable software.

3. The modulated laser light detector as recited in claim 2, wherein said processing circuit is configured:

(i) to control said at least one automatic gain control circuit for at least two channels of said at least one amplifier stage, a first of said channels corresponding to a first input channel of said at least one first electrical signal, and a second of said channels corresponding to a second input channel of said at least one first electrical signal;

(ii) to determine a first signal strength for a first channel of said at least one fourth electrical signal;

(iii) to determine a second signal strength for a second channel of said at least one fourth electrical signal; and

(iv) to compare said first signal strength and said second signal strength, thereby determining a relative position of said received modulated laser light energy impacting on said at least one laser light photosensor.

4. The modulated laser light detector as recited in claim 3, wherein said at least one laser light photosensor comprises a plurality of photocells, in which each of said plurality of photocells outputs one of said at least one first electrical signal; and further comprising:

(a) a plurality of analog switches that, under the control of said processing circuit, connect each of said plurality of photocells to one of: (i) a channel 1 signal and (ii) a channel 2 signal, wherein said channel 1 signal and said channel 2 signal are indicative of said relative position of said received modulated laser light energy impacting on said at least one laser light photosensor.

5. The modulated laser light detector as recited in claim 1, further comprising: an analog summing stage that receives a first channel of said at least one second electrical signal and receives a second channel of said at least one second electrical signal, and outputs a summed electrical signal; and

wherein said summed electrical signal is connected as an input to said phase and frequency detector, and is used for generating said lock signal.

6. An electronic circuit, comprising:

(a) a first amplifier stage that outputs a first electrical signal having a first waveform that exhibits voltage components of both positive-going and negative-going regions;

(b) a phase and frequency detector that receives said first electrical signal and generates a lock signal that corresponds to a zero crossing of said first waveform;

(c) a first synchronous rectifier stage that receives said first electrical signal and generates a second electrical signal of a second waveform, in which said second waveform substantially comprises a rectified version of said first waveform and exhibits a voltage component having substantially only a single one of a positive-going and a negative-going region;

(d) a first low pass filter that receives said second electrical signal and outputs a third electrical signal that comprises a substantially DC voltage; and

(e) a laser light photosensor, which generates a fourth electrical signal when receiving modulated laser light energy having at least one predetermined range of wavelengths and at least one predetermined range of modulation frequencies.

7. The electronic circuit as recited in claim 6, further comprising: an automatic gain control circuit that is in electrical communication with said first amplifier stage.

8. The electronic circuit as recited in claim 6, wherein: (i) said fourth electrical signal is input to said first amplifier stage that outputs said first electrical signal; and (ii) said substantially DC voltage of the third electrical signal exhibits a predetermined magnitude for a particular signal strength of said received modulated laser light energy.

9. The electronic circuit as recited in claim 8, further comprising: a first signal strength detector that inspects the substantially DC voltage of said third electrical signal and determines a relative strength of said received modulated laser light energy.

10. The electronic circuit as recited in claim 9, wherein said laser light photosensor comprises a plurality of photocells, in which each of said plurality of photocells outputs a channel of said fourth electrical signal.

11. The electronic circuit as recited in claim 10, further comprising:

(a) a processing circuit and an associated memory circuit having a plurality of memory elements which contain computer executable software; and

(b) a plurality of analog switches that, under the control of said processing circuit, connect each of said plurality of photocells to one of: (i) a channel 1 signal and (ii) a channel 2 signal, wherein said channel 1 signal and said channel 2 signal are indicative of said relative position of said received modulated laser light energy impacting on said at least one laser light photosensor;

wherein said processing circuit is configured to perform the functions of said first signal strength detector.

12. The electronic circuit as recited in claim 11, further comprising: a first automatic gain control circuit that is in electrical communication with said first amplifier stage, and a second automatic gain control circuit that is in electrical communication with a second amplifier stage;

wherein: said channel 1 signal is input to said first amplifier stage with said first automatic gain control circuit, said channel 2 signal is input to said second amplifier stage with said second automatic gain control circuit, and said first electrical signal exhibits two output channels; and

wherein said processing circuit is configured to control said first and second automatic gain control circuits.

13. The electronic circuit as recited in claim 12, further comprising: a second synchronous rectifier stage which outputs a second channel of said second electrical signal, a second low pass filter which outputs a second channel of said third electrical signal, and a second signal strength detector that inspects the substantially DC voltage of the second channel of said third electrical signal and determines a relative strength of said received modulated laser light energy for said second channel.

14. The electronic circuit as recited in claim 13, wherein said processing circuit is configured:

(i) to determine a first signal strength for said first channel of said third electrical signal;

(ii) to determine a second signal strength for said second channel of said third electrical signal; and

(iii) to compare said first signal strength and said second signal strength, thereby determining a relative position of said received modulated laser light energy impacting on said laser light photosensor.

15. The modulated laser light detector as recited in claim 14, further comprising: an analog summing stage that receives the first channel of said third electrical signal and receives the second channel of said third electrical signal, and outputs a summed electrical signal; and

wherein said summed electrical signal is connected as an input to said phase and frequency detector, and is used for generating said lock signal.

16. A synchronous rectifier circuit, comprising:

(a) a phase and frequency detector that receives a first electrical signal of a first waveform and generates a lock signal that changes logic states upon a zero crossing of said first waveform, wherein said first waveform exhibits voltage components in both positive-going and negative-going regions;

(b) a multiple-input analog signal multiplexer that: (i) receives said first electrical signal at a first input, (ii) receives a virtual ground reference signal at a second input, (iii) receives said lock signal at a control input, and (iv) outputs a second electrical signal that comprises substantially one of: (A) said first electrical signal and (B) said virtual ground reference signal, depending upon the logic state of said lock signal at the control input; and

(c) a gain amplifier that receives said second electrical signal, said gain amplifier having an effective voltage gain of substantially $+A_V$ when said lock signal is at a first logic state, and said gain amplifier having an effective voltage gain of substantially $-A_V$ when said lock signal is at a second logic state.

17. The synchronous rectifier circuit as recited in claim 16, wherein said gain amplifier outputs a third electrical signal of a second waveform, in which said second waveform substantially comprises a rectified version of said first waveform and exhibits a voltage component having substantially only a single one of said positive-going and negative-going regions.

18. The synchronous rectifier circuit as recited in claim 16, wherein a numeric value of $+A_V$ is substantially equal to +1, and a numeric value of $-A_V$ is substantially equal to –1.

19. The synchronous rectifier circuit as recited in claim 16, wherein said gain amplifier comprises an operational amplifier having (i) its positive input connected to the output of said analog signal multiplexer, (ii) its negative input connected to a node between an input resistor and a feedback resistor, (iii) its output connected to an opposite side of said feedback resistor from said node, and (iv) its power supply inputs connected to a +VDC power rail and to DC common;

wherein: (i) said input resistor has its side opposite from said node connected to the first input of said analog signal multiplexer; (ii) said input resistor and said feedback resistor are substantially equal in resistance; and (iii) said virtual ground reference signal is substantially equal to one-half of said +VDC power rail.

20. The synchronous rectifier circuit as recited in claim 16, further comprising: a low pass filter that receives said third electrical signal and outputs a fourth electrical signal that comprises a substantially DC voltage.